118962

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 25]

[Docket No. FAA-1999-6063; Notice No. 99-16A] – 12

RIN 2120-AG80

Revision of Braking Systems Airworthiness Standards to Harmonize with European Airworthiness Standards for Transport Category Airplanes.

AGENCY: Federal Aviation Administration, DOT.

ACTION: Supplemental notice of proposed rulemaking. (SNPRM)

SUMMARY: This document seeks public comment on changes proposed as a result of the comments received on Notice No. 99-16. The changes proposed in this supplemental notice would require an additional dynamometer test during brake qualification, namely, an accelerate-stop test with the brake heat sink in a new condition (also called a new brake rejected takeoff (RTO) test) for part 25 transport category airplanes. The new proposed brake test could result in a minimal cost increase for some part 25 small airplanes. These changes are intended to benefit the public interest by standardizing certain requirements, concepts, and procedures in the airworthiness standards without reducing, but potentially enhancing, the current level of safety.

DATES: Comments must be received on or before [Insert date 60 days after date of publication in the Federal Register]

ADDRESSES: Address your comments to the Docket Management System, U.S. Department of Transportation, Room PL 401, 400 Seventh Street NW, Washington DC 1/18/00

Part IV Comments 3/16/01

20590-0001. You must identify the docket number FAA-1999-6063 at the beginning of your comments, and you should submit two copies of your comments. If you wish to receive confirmation that FAA has received your comments, include a self addressed, stamped postcard.

You may also submit comments through the Internet to: http://dms.dot.gov. You may review the public docket containing comments to these proposed regulations in person in the Docket Office between 9:00 a.m. and 5:00 p.m., on the plaza level of the Nassif Building at the Department of Transportation at the above address. Also, you may review public dockets on the Internet at http://dms.dot.gov.

FOR FURTHER INFORMATION CONTACT: Mahinder K. Wahi, FAA, Propulsion/Mechanical Systems Branch, ANM-112, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA 98055-4056; telephone (425) 227-2142; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Substantive comments should be accompanied by cost estimates. Commenters must identify the regulatory docket or notice number and submit comments in duplicative to the DOT Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel concerning this rulemaking, will be filed in the docket. The Docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered by the Administrator before taking action on this proposed rulemaking. Comments filed late will be considered as far as possible without incurring expense or delay. The proposals contained in this notice may be changed in light of the comments received.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a pre-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. FAA-1999-6063." The postcard will be date stamped and mailed to the commenter.

Availability of the SNPRM

You can get an electronic copy using the Internet by taking the following steps:

(1) Go to the search function of the Department of Transportation's electronic Docket Management System (DMS) Web page (http://dms.dot.gov/search).

(2) On the search page type in the last four digits of the Docket number shown at the beginning of this notice. Click on "search."

(3) On the next page, which contains the Docket summary information for the Docket you selected, click on the final rule.

You can also get an electronic copy using the Internet through FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm or the Federal Register's web page at http://www.access.gpo.gov/su_docs/aces/aces140.html.

You can also get a copy by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9680. Make sure to identify the amendment number or docket number of this notice.

Background

On August 10, 1999, the the FAA issued an NPRM titled "Revision of Braking Systems Airworthiness Standards To Harmonize With European Airworthiness Standards for Transport Category Airplanes," Notice No. 99-16 (64 FR 43570), and two Notices of Availability, "Proposed TSO-C135, Transport Airplane Wheels and Wheel and Brake Assemblies," and "Proposed Advisory Circular (AC) 25.735-1X, Brakes and Braking Systems Certification Tests and Analysis." The related background material leading to Notice No. 99-16 and the notices of availability is as follows:

In 1988, the FAA, in cooperation with the JAA and other organizations representing the American and European aerospace industries, began a process to harmonize the airworthiness requirements of the United States and the airworthiness requirements of Europe, especially in the areas of Flight Test and Structures.

Starting in 1992, the FAA's harmonization effort for various systems-related airworthiness requirements was undertaken by the ARAC. A working group of industry and government braking systems specialists of Europe, the United States, and Canada was chartered by notice in the Federal Register (59 FR 30080, June 10, 1994). The working group was tasked to develop a harmonized standard, such as a Technical Standard Order (TSO), for approval of wheels and brakes to be installed on transport category airplanes and to develop a draft notice of proposed rulemaking (NPRM), with

supporting economic and other required analyses, and/or any other related guidance material or collateral documents, such as advisory circulars, concerning new or revised requirements and the associated test conditions for wheels, brakes and braking systems, installed in transport category airplanes (§§ 25.731 and 25.735).

The harmonization task was completed by the working group and recommendations were submitted to the FAA by a letter dated May 1, 1998. The FAA concurred with the recommendations and proposed them in Notice No. 99-16. A notice of availability of proposed TSO-C135 and request for comments and a notice of availability of proposed AC 25.735-1X and request for comments were also published in the Federal Register on August 10, 1999 (64 FR 43579). On August 25, 1999, the JAA issued two Notices of Proposed Amendment (NPA) 25D-291 & NPA TSO-7: "Brakes and Braking Systems" that included the proposed advisory material AMJ 25.735. The amendments proposed in NPA 25D-291 and the advisory material proposed in AMJ 25.735 were substantively the same as the amendments proposed by the Notice No. 99-16 and the advisory material in proposed AC 25.735-1X. The NPA TSO-7 was substantively the same as proposed TSO-C135.

As a result, the FAA and JAA each received a set of comments from the public in response to the proposed rule, the proposed TSO, and the proposed AC. These two sets of comments are interlinked and addressed jointly by the FAA in preparing this SNPRM.

Discussion of Comments: Notice 99-16

Twenty-one commenters responded to the request for comments contained in Notice No. 99-16, the notices of availability of proposed TSO-C135 and AC 25.735-1, and the corresponding JAA documents NPA 25D-291, NPA TSO-7, and AMJ 25.735 Comments were received from eight (8) foreign and domestic airplane and brake manufacturers, nine (9) foreign airworthiness authorities, one operator and three (3) foreign and domestic industry organizations. The majority of the commenters agree with the proposal and recommend its adoption. However, some commenters disagree with the proposal while providing alternative proposals that appear to merit further consideration by the ARAC. Therefore, the FAA tasked the ARAC Braking Systems Harmonization Working Group (HWG) by letter dated February 8, 2000, to consider the comments and provide recommendations for the disposition of the comments along with any recommendations for changes to the proposal. Proposal 11 is the only proposal relevant to this SNPRM. The disposition of the comments below is based on the agreement reached by the HWG.

Proposal 11, § 25.735(f)

The proposed paragraph § 25.735(f) in Notice No. 99-16 reads as follows:

(f) Kinetic energy capacity. The design landing stop, the maximum kinetic energy accelerate-stop, and the most severe landing stop brake kinetic energy absorption requirements of each wheel and brake assembly must be determined. It must be substantiated by dynamometer testing that, at the declared fully worn limit(s) of the brake heat sink, the wheel and brake assemblies are capable of absorbing not less than these levels of kinetic energy. Energy absorption rates defined by the airplane manufacturer

must be achieved. These rates must be equivalent to mean decelerations not less than 10 fps^2 for the design landing stop and 6 fps^2 for the maximum kinetic energy accelerate stop. The most severe landing stop need not be considered for extremely improbable failure conditions or if the maximum kinetic energy accelerate-stop energy is more severe. Design landing stop is an operational landing stop at maximum landing weight. Maximum kinetic energy accelerate-stop is a rejected takeoff for the most critical combination of airplane takeoff weight and speed. Most severe landing stop is a stop at the most critical combination of airplane landing weight and speed.

Comment: One commenter states that as proposed, §25.735(f) is difficult to read and contains too many separate requirements in itself. It could create undue difficulties during the finding of compliance. It is suggested that the paragraph be re-arranged such that:

- there is a distinct sub-paragraph that can be identified for the requirement for the determination of the levels of kinetic energy and the energy absorption rates. This paragraph should indicate that three cases are to be considered (design landing stop, accelerate-stop, and most severe landing stop). This sub-paragraph could also mention the caveats about the need to consider, or not consider, during testing the most severe landing stop.
- there is a distinct sub-paragraph for the requirement for the wheel and brake assembly to meet the levels of kinetic energy.
- there is a distinct sub-paragraph for the requirement for the wheel and brake assembly to meet the energy absorption rates.

- the definitions of the three stop cases (the last 9 lines of the currently proposed paragraph, starting with: "... Design landing stop is an operational...") are taken out of the requirement and placed in the proposed AC 25.735-1X.

The FAA concurs that rearranging § 25.735(f) into three distinct sub-paragraphs clarifies the requirement. The FAA, however, decided that it is more appropriate to retain the definitions as part of the regulatory text, since this is the only place where these terms are identified.

The text of this paragraph is divided into three subparagraphs f(1), f(2), and f(3) with appropriate headings. The subparagraphs cover each of the three tests and include the definitions.

Comment: Two commenters suggest adding a requirement that the accelerate-stop test, reference: paragraph 3.3.3.2 of the proposed TSO-C135, and § 25.735(f) of Notice No. 99-16, must be completed on both a new brake and a fully worn brake. The fully worn brake is the worst case condition for energy absorption capability, however, the new brake condition is the worst case condition for performance for some heat sink materials. [The heat sink is the mass of the brake that is primarily responsible for absorbing energy during a stop. For a typical brake, this would consist of the stationary and rotating disc assemblies.]

The FAA concurs with this comment. Applicable text in the TSO-C135 paragraph 3.3.3.2, and the new § 25.735(f)(2) in this SNPRM add a new brake accelerate-stop test requirement with the new brake defined as a brake worn no more than 5 percent of its usable wear range. The accelerate-stop applicable portion of § 25.735(f) text, Notice No. 99-16, is revised from "It must be substantiated by dynamometer testing that,

at the declared fullyworn limit(s) of the brake heat sink, the wheel and brake assemblies are capable of absorbing not less than these levels of kinetic energy" to "(f)(2): It must be substantiated by dynamometer testing that the wheel, brake, and tire assembly is capable of absorbing not less than this level of kinetic energy throughout the defined wear range of the brake." Although, not a part of the TSO, large airplane manufacturers currently require a new brake RTO test as part of brake qualification. Small airplane manufacturers may experience a cost increase of $20,000 per certification.

The New Proposal

The revised proposed rule reads as follows:

(f) Kinetic energy capacity

(1) Design landing stop: The design landing stop is an operational landing stop at maximum landing weight. The design landing stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that the wheel, brake and tire assembly is capable of absorbing not less than this level of kinetic energy throughout the defined wear range of the brake. The energy absorption rate derived from the airplane manufacturer's braking requirements must be achieved. The mean deceleration must not be less than 10 fps^2.

(2) Maximum kinetic energy accelerate-stop: The maximum kinetic energy accelerate-stop is a rejected takeoff for the most critical combination of airplane takeoff weight and speed. The accelerate-stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that the wheel, brake, and tire assembly is capable of absorbing not

less than this level of kinetic energy throughout the defined wear range of the brake. The energy absorption rate defined by the airplane manufacturer must be achieved. The mean deceleration must not be less than 6 fps^2.

(3) Most severe landing stop: The most severe landing stop is a stop at the most critical combination of airplane landing weight and speed. The most severe landing stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that, at the declared fully worn limit(s) of the brake heat sink, the wheel, brake and tire assembly is capable of absorbing not less than this level of kinetic energy. The most severe landing stop need not be considered for extremely improbable failure conditions or if the maximum kinetic energy accelerate-stop energy is more severe.

The rulemaking proposal contained in this supplemental notice is based on a recommendation developed by the Braking Systems Harmonization Working Group, and presented to the FAA by the ARAC as a recommendation.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C 3507(d)), the FAA has determined that there are no requirements for information collection associated with this proposed rule.

Compatibility with ICAO Standards

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. For

this SNPRM, the FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these proposed regulations.

Regulatory Evaluation Summary, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Proposed changes to Federal Regulations must undergo several economic analyses. First, Executive Order 12866 directs that each federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic effect of regulatory changes on small entities. Third, the Trade Agreements Act (19 U.S.C. section 2531-2533) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards, and, where appropriate, to use those standards as the basis of U.S. standards. Fourth, Title II of the Unfunded Mandates Reform Act of 1995 requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million in any one year. In conducting these analyses, the FAA has determined that this supplemental proposal: (1) would generate benefits that justify its costs and is not "a significant regulatory action" as defined in Executive Order 12866 or in the Department of Transportation's Regulatory Policies and Procedures; (2) would not have a significant impact on a substantial number of small entities; (3) would not constitute a barrier to

international trade, and (4) does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any one year.

These analyses, available in the docket, are summarized below. All estimates are expressed in year 2000 dollars.

Regulatory Evaluation Summary

Summary of Major Economic Issues in NPRM 99-16

Of several revisions proposed for 14 CFR 25.735, only one, proposal 11, was expected to impose additional costs, estimated at $20,000 to $60,000 (the latter upper estimate has been reduced to $40,000) for part 25 large airplanes and $20,000 (as explained below, the latter estimate has been increased to a range of $20,000 to $40,000) for part 25 small airplanes. Most of the changes codify current industry practice or conform 14 CFR 25.735 to corresponding sections of the JAR. The resulting regulatory harmonization would eliminate unnecessary duplication of airworthiness requirements, thus reducing manufacturers' certification costs.

None of the commenters disputes FAA's estimates of specific incremental certification costs. One commenter, however, questions FAA's contention that costs would be balanced by the savings from rule harmonization, and further objects to the vagueness of the expected safety benefits. The FAA disagrees with the latter commenter's synopsis of the benefits' conclusion in the NPRM. The FAA did not contend that quantified benefits from averted future accidents alone would economically justify the proposed rule. Although total harmonization savings were not specified, the FAA nevertheless stated that "according to one manufacturer, cost savings from harmonization .....would be equal to or greater than the maximum incremental cost

of $60,000." The FAA also noted that "potential safety benefits resulting from specification of minimum accepted standards would supplement these cost savings." In addition, even though none of the previous accidents would have been directly preventable by the proposed amendments, "different designs in future type certifications, however, could present other problems (unexpected) and raise future accident rates."

Notwithstanding the above, since publication of Notice 99-16, the FAA has contacted industry sources to obtain estimates of harmonization cost savings attributable to the revisions originally proposed in the Notice. These cost savings would be, at a minimum, between $50,000 and $75,000 for a part 25 small airplane type certification and $100,000 to $300,000 for a part 25 large airplane type certification. These harmonization benefits would exceed the incremental costs of all the revisions specified in the NPRM as well as the costs attributable to the SNPRM change.

Supplemental Change and Associated Costs and Benefits

The proposed dynamometer test, also called a new brake rejected takeoff (RTO) test, is currently conducted by brake manufacturers as specified by large airplane manufacturers during brake qualification testing and is considered standard industry practice. For some manufacturers of part 25 small airplanes, however, the proposed test could result in a cost increase of $20,000 per type certification (thus increasing incremental costs for proposal 11 in the NPRM from an estimated $20,000 to a range of $20,000 to $40,000). This incremental but nonrecurring cost for some manufacturers of part 25 small airplanes would easily be offset by the harmonization cost savings cited earlier. Any potential safety benefits from avoiding even one minor accident would add

to such benefits. The FAA, therefore, finds the additional change to proposal 11 to be cost beneficial for both part 25 small and large airplane manufacturers..

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation. To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a "significant economic impact on a substantial number of small entities." If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA.

However, if an agency determines that a proposed or final rule is not expected to have a significant impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

This SNPRM would affect manufacturers of transport category airplanes produced under future new airplane type certifications. For airplane manufacturers, a small entity is one with 1,500 or fewer employees. Since no part 25 airplane

manufacturer has 1,500 or fewer employees, the FAA certifies that the rule will not have a significant economic impact on a substantial number of small manufacturers.

International Trade Impact Assessment

Consistent with the Administration's belief in the general superiority, desirability, and efficacy of free trade, it is the policy of the Administrator to remove or diminish, to the extent feasible, barriers to international trade, including both barriers affecting the export of American goods and services to foreign countries and those affecting the import of foreign goods and services into the United States.

In accordance with that policy, the FAA is committed to develop as much as possible its aviation standards and practices in harmony with its trading partners. Significant cost savings can result from this, both to United States' companies doing business in foreign markets, and foreign companies doing business in the United States.

The subject proposal is a direct action to respond to this policy by increasing the harmonization of the U.S. Federal Aviation Regulations with the European Joint Aviation Requirements. The result would be a positive step toward removing impediments to international trade.

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995 (the Act), codified in 2 U.S.C. 1501-1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year.

This supplemental proposal does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million in any one year. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Regulations Affecting Interstate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator when modifying regulations in title 14 of the CFR in a manner affecting interstate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish such regulatory distinctions as he or she considers appropriate. Because this proposed rule would apply to the certification of future designs of transport category airplanes and their subsequent operation, it could, if adopted, affect interstate aviation in Alaska. The FAA therefore specifically requests comments on whether there is justification for applying the proposed rule differently in interstate operations in Alaska.

Executive Order 13132, Federalism

The FAA has analyzed this proposed rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, we determined that this proposed rule does not have federalism implications.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental impact

statement. In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this proposed rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) Pub L. 94-163, as amended (42 U.S.C. 6362) and FAA Order 1053.1. It has been determined that the notice is not a major regulatory action under the provisions of the EPCA.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend part 25 of Title 14, Code of Federal Regulations, as follows:

PART 25 - AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

1. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

2. Revise § 25.735(f) to read as follows:

§ 25.735 Brakes and braking systems

******

(f) Kinetic energy capacity.

(1) Design landing stop: The design landing stop is an operational landing stop at maximum landing weight. The design landing stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that the wheel, brake and tire assembly is capable

of absorbing not less than this level of kinetic energy throughout the defined wear range of the brake. The energy absorption rate derived from the airplane manufacturer's braking requirements must be achieved. The mean deceleration must not be less than 10 fps^2.

(2) Maximum kinetic energy accelerate-stop: The maximum kinetic energy accelerate-stop is a rejected takeoff for the most critical combination of airplane takeoff weight and speed. The accelerate-stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that the wheel, brake, and tire assembly is capable of absorbing not less than this level of kinetic energy throughout the defined wear range of the brake. The energy absorption rate defined by the airplane manufacturer must be achieved. The mean deceleration must not be less than 6 fps^2.

(3) Most severe landing stop: The most severe landing stop is a stop at the most critical combination of airplane landing weight and speed. The most severe landing stop brake kinetic energy absorption requirement of each wheel, brake, and tire assembly must be determined. It must be substantiated by dynamometer testing that, at the declared fully worn limit(s) of the brake heat sink, the wheel, brake and tire assembly is capable of absorbing not less than this level of kinetic energy. The most severe landing stop need not be considered for extremely improbable failure conditions or if the maximum kinetic energy accelerate-stop energy is more severe.

Issued in Renton, Washington on DEC - 4 2000

John J. Hickey
Manager

Transport Airplane Directorate
Aircraft Certification Service